

Attorney Docket No. 130924.62121  
Serial No. 10/717,246  
Inventor: Adams et al.  
Paper dated March 28, 2006

### REMARKS

Applicants attorney would like to thank the Examiner for her careful consideration in this application, and for the courteous telephonic discussion extended to the undersigned on February 28, 2006. A number of issues were discussed during the interview relating to the amphipathic dispersant being used by Applicants, as well as the issues relating to dispersing the semiconductive nanoparticles of Applicants' claimed invention.

Claims 1-16 are pending in the present application. Independent claim 1 has been amended to specifically require that the nanoparticles are semiconductive nanoparticles. Support for this amendment can be found in the specification as originally filed. No new matter has been added.

### Objections to Claims

Claims 12 and 13 stand objected to because the Examiner feels the use of "poly(acrylic acid-co-octylacrylamide)" seems incorrect. Applicants submit that the use of "-co-" is known in the art to define a polymer that, for example, is the result of combining acrylic acid and octylacrylamide and respectfully request that the objection be withdrawn.

### Rejections under 35 USC 103

Claims 1-16 stand rejected under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,319,426 to Bawendi et al. (hereinafter "Bawendi") in view of U.S. Patent No. 5,221,334 to Ma et al. (hereinafter "Ma") and also Ma in view of Bawendi. The rejection is respectfully traversed, especially in light of the presently presented claim amendments.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught to suggested by the prior art." *In re Royka*, 490 F.2d 981, 180 USPQ 580 (Fed. Cir. 1974). "In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claims limitations. The teachings or suggestions to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure." See MPEP § 2142, citing *In re Vaeck*, 947 F.2d 488, 20 USPQ 2d. 1438 (Fed. Cir. 1991). The Examiner's rejection fails to satisfy these requirements, particularly in light of the presently presented claim amendments.

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Bawendi describes a semiconductor nanocrystal that is water-soluble. The Examiner concedes that Bawendi fails to describe, teach, or suggest a block copolymer having an AB-type structure in which the A block is hydrophobic and the B block is hydrophilic. The Examiner alleges that the Ma describes an AB block copolymer having an A block that is hydrophobic and a B block that is hydrophilic, and that it would have been obvious to one skilled in the art to use the AB copolymer of Ma as the dispersant of Bawendi.

Applicants respectfully disagree. Applicants submit that there is no motivation to combine the teachings of Bawendi with the teachings of Ma to arrive at Applicant's invention. The Examiner is reminded that Bawendi requires that a portion of the moiety interact directly with the nanoparticle. The semiconductor nanocrystal of Bawendi is coated with a moiety that contains a linking group, the "functionalized layer", which interacts directly with the metal ion of the shell of the nanocrystal. The moiety also includes a hydrophilic group that allows the semiconductor nanocrystal to be water solublized. Ma clearly fails to provide any description, teaching or suggestion that the polymer of Ma is able to interact with a nanoparticle that has a substantially inert surface. As taught by Ma, the hydrophobic portions of the polymer of Ma interact directly with hydrophobic regions on the surface of the pigment. Applicants submit that the nanoparticles of Bawendi are substantially devoid of regions on their surfaces that one would expect to interact with the polymers of Ma. Furthermore, one of ordinary skill in the art would not expect to combine the polymers of Ma with the nanoparticles of Bawendi to arrive at a method of dispersing the particles of Bawendi because the polymer of Ma would not interact with the nanocrystal of Bawendi. Specifically, one would not expect such a combination to result in a polymer coated "water-dispersible semiconductive nanoparticle".

Even assuming arguendo that there is motivation to combine Ma and Bawendi, it is well established that if a proposed modification by the combination of the references would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to combine the references. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Therefore, if the Examiner is relying on Bawendi for its teaching of the nanocrystal alone, one would not expect the amphipathic polymers of Ma to interact with the substantially inert surface of the semiconductor nanocrystal. Similarly, if the Examiner is relying on Bawendi for its teaching of a functionalized nanocrystal, one would likely produce a nanoparticle whose outermost surface is hydrophobic when combined with the amphipathic polymer of Ma. This is because the hydrophilic groups of the amphipathic polymer and

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nanocrystal coating would interact leaving the hydrophobic portion of the amphipathic polymer to interface with water. The resulting nanoparticle would be strongly hydrophobic. Accordingly the proposed modification resulting from the combination of Ma with Bawendi would not yield the intended purpose of Bawendi, namely a hydrophilic nanocrystal, thereby further establishing that there is no suggestion or motivation to combine the references.

Accordingly, it is respectfully submitted that the Examiner has failed to make a *prima facie* case of obviousness using the combinations of either Bawendi in view of Ma or Ma in view of Bawendi as these combinations of references would not provide water-dispersible semiconductive nanoparticles as recited in amended independent claim 1. For at least the reasons above, Applicants respectfully request reconsideration of the Examiner's rejections of claims 1-16.

In view of the above amendments and remarks, it is believed that pending claims 1-16 are in condition for allowance and notice to such effect is respectfully requested. Although Applicants believe no fees are due, the Commissioner is hereby authorized to charge Deposit Account No. 50-0436 for any fees that may be due in connection with this response. Should the Examiner have any questions regarding this application, the Examiner is invited to initiate a telephone conference with the undersigned.

Respectfully Submitted,



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